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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,542	09/22/2003	Robert Anthony DeLine	MS304414.1 /MSFTP464US	9926
27195 7590 06/21/2007 AMIN. TUROCY & CALVIN, LLP 24TH FLOOR, NATIONAL CITY CENTER 1900 EAST NINTH STREET CLEVELAND, OH 44114			EXAMINER YIGDALL, MICHAEL J	
			ART UNIT 2192	PAPER NUMBER
			MAIL DATE 06/21/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/667,542

**Applicant(s)**

DELINE ET AL.

**Examiner**

Michael J. Yigdoll

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This Office action is responsive to Applicant's submission filed on April 11, 2007.

Claims 1-25 are pending.

#### ***Response to Amendment***

2. The objection to the specification has been withdrawn in view of Applicant's amendments and remarks (remarks, page 7).

#### ***Response to Arguments***

3. Applicant's arguments with respect to the rejection of claims 17-21, 24 and 25 under 35 U.S.C. 101 (remarks, pages 9-10) have been fully considered and are persuasive. The rejection has been withdrawn.

4. Applicant's arguments with respect to the rejection of claims 1-16, 22 and 23 under 35 U.S.C. 101 (remarks, pages 8-9) have been fully considered but they are not persuasive.

Applicant contends, "The Examiner incorrectly contends that the claimed subject matter is non-statutory because it could be construed as being software alone, not embodied in a computer readable medium," and states, "The Federal Circuit in *Eolas Techs., Inc. v. Microsoft Corp.* clearly established that software code alone is statutory subject matter" (remarks, page 8).

However, Applicant misconstrues the decision. Here, as Applicant cites (remarks, page 8), the Federal Circuit states that software code alone qualifies as an invention eligible for patenting under these categories, at least as processes (emphasis added). Claims 1-16, 22 and 23 are not directed to methods or processes. Instead, claims 1-16 are directed to "executable code

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check system[s],” and claims 22 and 23 are directed to “data packet[s].” As recited, the claimed subject matter amounts to software or descriptive material *per se*, which is not a process, not a machine, not a manufacture, and not a composition of matter. Therefore, the claimed subject matter does not fall within any category of statutory subject matter.

5. Applicant’s arguments with respect to the rejection of claims 1-25 under 35 U.S.C. 103(a) (remarks, pages 10-13) have been fully considered but they are not persuasive.

Applicant contends that the DeLine reference teaches away from a persisted embedded specification in the object file (remarks, page 11).

However, the examiner disagrees. As set forth in the Office action, DeLine teaches a file that includes a persisted embedded specification (see, for example, page 1, section 1, “The Vault programming language ...” et seq.). DeLine does not expressly disclose that the file is an object file. Nonetheless, DeLine’s description that elements of the specification are “purely compile-time entities that have no impact on runtime representations or execution time” (page 2, section 2.1) is not evidence that embedding the specification in an object file would somehow render the system unsatisfactory for its intended purpose or change its principle of operation. Rather, DeLine’s description suggests merely that the persisted embedded specification is removed from the file before runtime/execution time. This does not somehow preclude embedding the specification in an object file. Furthermore, the examiner notes that claims 15, 16, 20, 21 and 23 do not recite an embedded specification.

Applicant characterizes the Rickel reference as teaching a static debugging tool for statically debugging a “representation of a binary program,” and contends that a “representation of a binary file” is not an object file according to Applicant’s invention (remarks, page 12).

However, Rickel is clearly directed to a “static debugging tool for use with a computer and a method for debugging a binary program file without requiring the execution of the binary program file in order to detect the presence of program errors and potential program errors” (column 1, lines 50-54). The binary program file is an object file. Rickel’s description of intermediate files or other representations of the binary program file does not serve to patentably distinguish Applicant’s claims over the references. Furthermore, while Applicant states that Rickel is silent with respect to any embedded specification (remarks, page 12), the examiner notes again that claims 15, 16, 20, 21 and 23 are likewise silent.

In response to Applicant’s other arguments (remarks, pages 12-13), the examiner notes that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. Moreover, the test for obviousness is not that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981), and *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

As set forth in the Office action, DeLine teaches receiving and statically checking a file based on an embedded specification (see, for example, page 1, Abstract). Rickel teaches receiving and statically checking the executable code of an object file based on a specification (see, for example, column 3, lines 18-26). Thus, the combination of DeLine and Rickel teach or

suggest receiving and statically checking the executable code of an object file based on an embedded specification. The combined teachings of the references would have suggested claimed invention to those of ordinary skill in the art.

***Terminal Disclaimer***

6. The terminal disclaimer filed on April 11, 2007 disclaiming the terminal portion of any patent granted on this application that would extend beyond the expiration date of any patent granted on Application No. 10/681,759 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Claim Rejections - 35 USC § 101***

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1-16, 22 and 23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

With respect to claims 1-9 (original), 10 (currently amended) and 11-14 (original), the claims are directed to an "executable code check system." However, as recited, the system amounts to software or descriptive material *per se*, which does not fall within any category of statutory subject matter. The system is not embodied on any computer-readable medium, nor are there any hardware components recited in the claim that would permit the functionality of the system to be realized. Therefore, the claims are directed to non-statutory subject matter. See MPEP § 2106.01.

With respect to claims 15 and 16 (original), the claims are directed to an “executable code check system.” However, as recited, the system amounts to software or descriptive material *per se*, which does not fall within any category of statutory subject matter. The system is not embodied on any computer-readable medium, nor are there any hardware components recited in the claim that would permit the functionality of the system to be realized. Therefore, the claims are directed to non-statutory subject matter. See MPEP § 2106.01.

With respect to claim 22 (original), the claim is directed to a “data packet transmitted between two or more computer components that facilitates static checking of executable code.” However, as recited, the data packet amounts to software or descriptive material *per se*, which does not fall within any category of statutory subject matter. The data packet is not embodied on any computer-readable medium, nor are there any hardware components recited in the claim that would permit the functionality of the data packet to be realized. The examiner notes that even the recited “computer components” are described as software (specification, page 5, lines 24-26). Therefore, the claim is directed to non-statutory subject matter. See MPEP § 2106.01.

With respect to claim 23 (original), the claim is directed to a “data packet transmitted between two or more computer components that facilitates static checking of executable code.” However, as recited, the data packet amounts to software or descriptive material *per se*, which does not fall within any category of statutory subject matter. The data packet is not embodied on any computer-readable medium, nor are there any hardware components recited in the claim that would permit the functionality of the data packet to be realized. The examiner notes that even

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the recited “computer components” are described as software (specification, page 5, lines 24-26).

Therefore, the claim is directed to non-statutory subject matter. See MPEP § 2106.01.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-8 and 11-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over “Enforcing High-Level Protocols in Low-Level Software” by DeLine et al. (art of record, “DeLine”) in view of U.S. Patent No. 5,854,924 to Rickel et al. (art of record, “Rickel”).

With respect to claim 1 (original), DeLine discloses an executable code check system (see, for example, page 1, Abstract) comprising:

an input component that receives a file having an embedded specification (see, for example, page 1, section 1, “The Vault programming language ...” et seq., which shows receiving a file having an embedded specification); and,

a checker that employs the specification to facilitate static checking of the file, the checker providing information if a fault condition is determined (see, for example, page 1, Abstract, which shows employing the specification to facilitate static checking of the file, and page 1, section 1, “Vault’s type checker exhaustively seeks and reports any violation of such a protocol,” which shows providing information if a fault condition is determined).



DeLine further discloses that the system operates at compile time (see, for example, page 7, section 4, "... Vault's type checker catches at compile time many of the errors ..."), but does not expressly disclose that the file is an object file.

However, in an analogous art, Rickel discloses an executable code check system (see, for example, the abstract). Rickel further discloses receiving an object file, employing a specification to facilitate static checking of the object file, and providing information if a fault condition is determined (see, for example, column 3, lines 18-26). The system is independent of the original programming language (see, for example, column 4, lines 35-39).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of DeLine to operate on an object file, as Rickel suggests. For example, one of ordinary skill in the art would have been motivated to modify the system of DeLine such that it is independent of the original programming language.

With respect to claim 2 (original), the rejection of claim 1 is incorporated, and DeLine in view of Rickel further discloses the checker further removing the embedded specification from the object file (see, for example, DeLine, page 3, section 2.1, "Since guards and keys are purely compile-time entities, the function foo will be compiled into a function taking an ordinary FILE parameter and an ordinary int parameter," which shows that the embedded specification is removed from the object file).

With respect to claim 3 (original), the rejection of claim 1 is incorporated, and DeLine in view of Rickel further discloses the specification comprising information associated with a method that performs at least one of allocation and release of a resource (see, for example,

DeLine, page 4, section 2.2, “Figure 2 shows three functions that use this region abstraction ...” et seq., which shows that the specification comprises information associated with a method that allocates and releases a resource).

With respect to claim 4 (original), the rejection of claim 1 is incorporated, and DeLine in view of Rickel further discloses the specification comprising information associated with an order in which methods of an object can be called (see, for example, DeLine, page 1, section 1, “Such a protocol can specify that operations must be performed in a certain order ...” et seq., which shows that the specification comprises information associated with an order in which methods can be called).

With respect to claim 5 (original), the rejection of claim 4 is incorporated, and DeLine in view of Rickel further discloses that method order is constrained by specifying a finite state machine in which the states have symbolic names and transitions between states are labeled with method names (see, for example, DeLine, page 4, section 2.3, “This interface uses the ability for keys to have states to enforce the necessary steps ...” et seq., which shows a finite state machine with states that have symbolic names such as “raw” and “named” and transitions that are labeled with method names such as “bind” and “listen”).

With respect to claim 6 (original), the rejection of claim 1 is incorporated, and DeLine in view of Rickel further discloses the specification comprising a state-machine protocol wherein a method specifies a pre-state and a post-state (see, for example, DeLine, page 2, section 2.1, “In Vault, a function’s type has a pre- and post-condition ...” et seq., which shows that a method specifies a pre- and post-state in the specification).

With respect to claim 7 (original), the rejection of claim 1 is incorporated, and DeLine in view of Rickel further discloses the specification comprising information associated with a transition of a finite state machine (see, for example, DeLine, page 4, section 2.3, “This interface uses the ability for keys to have states to enforce the necessary steps ...” et seq., which shows that the specification comprises information associated with a transition of a finite state machine).

With respect to claim 8 (original), the rejection of claim 1 is incorporated, and DeLine in view of Rickel further discloses the specification comprising at least one of a rule using an interface, system resource management, order of method calls and formatting of a string parameter (see, for example, DeLine, page 1, section 1, “The Vault programming language ...” et seq., which shows that the specification comprises system resource management).

With respect to claim 11 (original), the rejection of claim 1 is incorporated, and DeLine in view of Rickel further discloses the specification comprising information associated with a state-machine protocol (see, for example, DeLine, page 4, section 2.3, “This interface uses the ability for keys to have states to enforce the necessary steps ...” et seq., which shows that the specification comprises information associated with a state-machine protocol).

With respect to claim 12 (original), the rejection of claim 1 is incorporated, and DeLine in view of Rickel further discloses the specification comprising an attribute associated with at least one of a field and a parameter providing information associated with whether or not the at least one of a field and a parameter can be aliased (see, for example, DeLine, page 6, section 3.1,

“The key to ensuring that a program does not reference a resource after that resource has been released ...” et seq., which shows that the specification comprises an attribute associated with a field that provides information associated with whether the field can be aliased).

With respect to claim 13 (original), the rejection of claim 1 is incorporated, and DeLine in view of Rickel further discloses that the specification facilitates modeling of a heap modeling (see, for example, DeLine, page 3, section 2.2, “A typical C program ...” et seq., which shows that the specification facilitates heap modeling).

With respect to claim 14 (original), the rejection of claim 13 is incorporated, and DeLine in view of Rickel further discloses the checker employing an algorithm that performs a data flow analysis over the heap model comprising a typing environment and a set of capabilities (see, for example, DeLine, pages 6-7, section 3.3, “Existential types are useful for encoding that certain values carry capabilities ...” et seq., which shows performing an analysis over the heap model that comprises a typing environment and a set of capabilities).

With respect to claim 15 (original), the claim is directed to an executable code check system, the elements of which are analogous to those of claim 1 (see the rejection of claim 1 above).

DeLine in view of Rickel further discloses the specification stored in a specification repository (see, for example, Rickel, column 4, lines 32-35, which shows that the specification is stored in a library or repository).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the system of DeLine such that it operates with a specification stored in

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a repository, as Rickel suggests. For example, one of ordinary skill in the art would have been motivated to provide the system of DeLine with the flexibility to retrieve the specification from a repository external to the object file, so as employ the same specification to facilitate static checking of several object files.

With respect to claim 16 (original), the rejection of claim 15 is incorporated, and DeLine in view of Rickel further discloses the system further comprising the specification repository (see, for example, Rickel, FIG. 1a).

With respect to claim 17 (original), the claim is directed to a method of facilitating static checking of executable code, the elements of which are analogous to those of claim 1 (see the rejection of claim 1 above).

With respect to claim 18 (original), the rejection of claim 17 is incorporated, and DeLine in view of Rickel further discloses removing the embedded specification from the executable code (see the rejection of claim 2 above).

With respect to claim 19 (original), the claim is directed to a computer readable medium having stored thereon computer executable instructions for carrying out the method of claim 17 (see the rejection of claim 17 above).

With respect to claim 20 (original), the claim is directed to a method of facilitating static checking of executable code, the elements of which are analogous to those of claim 1 (see the rejection of claim 1 above).

With respect to claim 21 (original), the claim is directed to a computer readable medium having stored thereon computer executable instructions for carrying out the method of claim 20 (see the rejection of claim 20 above).

With respect to claim 22 (original), the claim is directed to a data packet transmitted between two or more computer components that facilitates static checking of executable code, the elements of which are analogous to those of claim 1 (see the rejection of claim 1 above).

With respect to claim 23 (original), the claim is directed to a data packet transmitted between two or more computer components that facilitates static checking of executable code, the elements of which are analogous to those of claim 1 (see the rejection of claim 1 above).

With respect to claim 24 (original), the claim is directed to a computer readable medium storing computer executable components of an executable code check system, the elements of which are analogous to those of claim 1 (see the rejection of claim 1 above).

With respect to claim 25 (original), the claim is directed to an executable code check system, the elements of which are analogous to those of claim 1 (see the rejection of claim 1 above).

11. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeLine in view of Rickel, as applied to claim 1 above, and further in view of U.S. Pub. No. 2004/0230958 to Alaluf (art of record, "Alaluf").

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With respect to claim 9 (original), the rejection of claim 1 is incorporated. DeLine in view of Rickel does not expressly disclose the object file being based, at least in part, upon a language that compile to Common Language Runtime.

However, in an analogous art, Alaluf discloses performing static analysis on code that is based on a language that compiles to a Common Language Runtime (see, for example, paragraph [0038], lines 1-2, paragraph [0003], lines 1-3, and paragraph [0004], lines 8-9). Such code is platform and CPU independent (see, for example, paragraph [0003], lines 1-4, and paragraph [0004], lines 13-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of DeLine and Rickel to operate on an object file that is based, at least in part, upon a language that compiles to a Common Language Runtime, as Alaluf suggests. For example, one of ordinary skill in the art would have been motivated to modify the system of DeLine and Rickel such that it is platform and CPU independent.

With respect to claim 10 (currently amended), the rejection of claim 1 is incorporated. DeLine in view of Rickel does not expressly disclose the object file being based, at least in part, upon at least one of C#, VISUAL BASIC.NET and Managed C++.

However, in an analogous art, Alaluf discloses performing static analysis on code that is based on C#, VISUAL BASIC.NET or Managed C++, among others (see, for example, paragraph [0038], lines 1-2, and paragraph [0003], lines 8-11, and paragraph [0004], lines 8-9). Such code is platform and CPU independent (see, for example, paragraph [0003], lines 1-4, and paragraph [0004], lines 13-17).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of DeLine and Rickel to operate on an object file that is based, at least in part, upon at least one of C#, VISUAL BASIC.NET and Managed C++, as Alaluf suggests. For example, one of ordinary skill in the art would have been motivated to modify the system of DeLine and Rickel such that it is platform and CPU independent.

### ***Conclusion***

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Yigdall whose telephone number is (571) 272-3707. The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MY

Michael J. Yigdall  
Examiner  
Art Unit 2192

mjy

  
TUAN DAM  
SUPERVISORY PATENT EXAMINER